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Rani Jeanne Dang

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# **Contribution to the DRUID-DIME Academy Winter Conference 2009**

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Rani J. DANG  
University of Nice Sophia-Antipolis, France.  
GREDEG research center CNRS, UMR 6227  
[dang@gredeg.cnrs.fr](mailto:dang@gredeg.cnrs.fr)

## **Territorial innovation dynamics and integration of SMEs into the collaborative innovation projects of French Poles of competitiveness: the underlying mechanisms**

**- with the (exploratory) case of “Secured Communicating Solutions” Pole of Competitiveness -**

**DRAFT**

### **Abstract**

Geographical clusters are nowadays considered as a relevant factor for competitiveness, thanks to their innovative capabilities. In this context, public policies based on this approach are flourishing all over the world. The French “Pole of competitiveness” (PoC) policy (*Politique des pôles de compétitivité*) is one of these initiatives. It is the new French industrial policy aiming at reinforcing the specializations of the economy and the attractiveness of territories by fostering the development of R&D projects, bringing together multinationals, universities, and particularly Small-Middle-Sized-Enterprises (SMEs). Precisely, significant research suggests that in order to innovate SMEs need to cooperate and they are also vital for the functioning, and survival of innovative milieux. Consequently, their integration is a key issue for French PoC’ success.

However, the call for projects shows that despite their efforts, French Poles of Competitiveness are not totally successful: a gap remains especially between the massive financial investments helping SMEs innovate and the expected results. Yet, this issue is only analysed by focusing on intrinsic weaknesses of SMEs’ management or on the complexities of existing support programmes supporting SMEs’ innovation. This is insufficient. Innovation dynamics are different from a cluster to another and many failures of innovation policies come from the lack of identification of these specificities.

Therefore, this paper aims are threefold: it aims at introducing the French PoC, indeed, the French PoC policy is the main new policy gathering all the nation’s innovation programmes. But few papers are explaining how they work. It aims at identifying the territorial innovation dynamics within PoC and how they work, and then combine this analysis with the intrinsic features of SMEs management, to better understand how they get involved in these dynamics. It finally aims at presenting the preliminary results of the first stage of research: the analysis of a specific French PoC, the “Secured Communicating Solutions”(SCS) PoC as well as the further research questions they raise for the next stage of research.

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### **INTRODUCTION**

In the last two decades, innovation research has been focusing on clusters as relevant for companies to cope with the challenges of the knowledge-based economy as well as the growing complexity of technology management (Amin, Cohendet 2003; Asheim, Gertler 2005, Camagni 2002).. In this perspective empirical studies have demonstrated that the performance of clusters results from the quality of the interactions and coordination inside the cluster as well as their synergies with external, often global, networks (Malmberg, Maskell 2005; Breschi, Lissoni 2001; Garnsey, Longhi 2004; Rychen, Zimmermann, 2006). In this context, public policies aiming at fostering cooperation between organisations within regions are flourishing.

The Pole of Competitiveness (PoC) program, the new French industrial policy, was launched in 2005 in this purpose. It aims at reinforcing the specialisations of the economy within regions and the attractiveness of the territories. In fact, French PoC are favouring synergies between organisations fostering the development of R&D projects by bringing together three different types of actors: multinationals, universities & research centres, and particularly Small and Middle Sized Enterprises (SMEs). Indeed, theoretically and empirically, significant research suggest that SMEs need to cooperate in order to innovate and at the same time they are a vital element in the existence, functioning, and survival of innovative milieux. Thus, the integration of SMEs into collaborative projects is a real condition of success for the PoC policy. The policy has taken this into account, highlighting the integration of SMEs as a key issue.

However, the results of the call for projects show that despite the efforts, French PoC are not totally successful in all regions. Particularly concerning SMEs. Indeed, a real gap remains between the massive financial investments to help SMEs innovate and the expected results. Yet, when studying the state-of-the-art literature as well as ministerial reports, one can find out that this issue is only tackled in two different ways: on a one hand by focusing on SMEs' specificities of management and on the other hand by denouncing the complexity, and tardiness of the measures supporting SMEs' innovation.

The paper suggests that this is not sufficient. Innovation dynamics are significantly different from a cluster to another and many failures of innovation policies can be explained by the lack of identification of the territorial innovation specificities. Therefore, this paper intends to identify the territorial innovation dynamics (types of interactions, nature of knowledge transferred...) within French PoC, and how they work, and then couple this analysis with the intrinsic features of SMEs to better understand how they get involved in these dynamics. The two aspects are thus taken into account.

These points have been studied by focusing on a French PoC: the Secured Communicating Solutions (SCS) PoC. A questionnaire has been sent to all the SMEs members of the PoC (50% rate of reply) in

order to capture the nature of their relations with their territory. This investigation is doubled with semi-directed interviews aiming at refining the understanding of the different innovation dynamics that emerge from the territory.

The first results provide powerful evidence of the importance of analysing both aspects: SCS PoC slogan “*from silicium to uses*”, implies that the PoC concept was built upon the idea to go beyond the four different activities of the sector (Telecommunications, software, microelectronics, multimedia/content ) in order to federate the complementarities of actors throughout the added value chain. The strength of this cluster concept comes from the idea of combining competences throughout the added value from microelectronics to uses. However the study reveals that the value chain is clearly drawn throughout the region but split into two different clusters: one in the West of the region with production and manufacturing competences and one in the East, oriented towards services, uses and technology applications. Moreover, one part is well integrating SMEs while the other part is not. Two different models of integration of SMEs into French PoC emerge as well as two different localised innovation dynamics, within a single French PoC. This raises the question of territorial governance.

So considered, French PoC program are widely implemented now, but very few papers are analysing them. This paper contributes to highlight the fundamental analytical insights that have to be considered in order to favour SMEs integration in French PoC. The first section will introduce the French PoC, question their emergence and position them. The second section will address the territorial innovation dynamics that can help to understand the question of SMEs’ involvement into French PoC projects. In the third section a particular focus will be put on the French SCS PoC case study as well as the methodology. Finally, the last section will briefly discuss the preliminary results that constitute the basis for the second phase of the empirical research and briefly present the research agenda for the next stage.

## **I. POSITIONING FRENCH POLES OF COMPETITIVENESS AND THE ROLE OF SMEs**

### **I.1. The French PoC**

#### **I.1.1. Specificities of French industrial policies and the emergence of French PoC**

With the European integration and the challenges of globalisation, French industrial policies have shifted, on a one hand, from centralised industrial policies to regional policies, and on the other hand, from a strategy focused on regional planning to a strategy focused on R&D to reinforce main existing national assets.

### **From centralised industrial policies to regional policies focusing on clusters.**

Traditionally in France, research and innovation have always been characterised by the intervention of public authorities. The French innovation and research system is viewed in the literature as following the Colbertist approach, as « the Colbertist State », that is to say a model based on the intervention of the state and which gives the priority to major civil and defence programmes, that put forward the supremacy of congenital separation between research and firms and to the monopolisation of public support by some large industrial groups. This traditional approach is no longer relevant in capturing the current dynamic of the French research and innovation system. (Laredo, Mustar, 2002).

In fact, the focus of the French innovation policy has basically changed, from firms – the national champions – that constituted the main interest for industrial, scientific or technological policies, to clusters approach. The clusters might now be considered as the new « national champions », the essential place for innovation, wealth and knowledge creation, and the key channels for the attractiveness of external resources to the country. The French PoC policy aims at fostering these processes in the clusters, which encompass industrial, science and technology, regional policies. Though defined and implemented by the central government, it is described as a bottom-up policy (Longhi, 2008). Nowadays, French innovation and research policies are focusing on the cluster approach.

### **From a strategy focused on regional planning and development (land settlement) to a strategy focused on research and development (R&D) to reinforce main existing national assets.**

Besides, innovation and research policies in France have always been thought with the goal of developing the territory evenly. Therefore, the focus has been on regional planning for the development of all regions especially for those that have fewer resources. Innovation is then viewed as important for regional development. In fact, the failure in the convergence process in Europe is often attributed to the lack of local resources necessary to benefit from structural funds. Consequently, the policies have to help in the building of these resources.

As far as local knowledge and local capabilities embedded in territories are basic for knowledge creation and innovation as such; in the global knowledge based economy, innovation cannot be thought out of its local dimension. High-tech clusters embody these characteristics and are becoming what the governments want to foster to guarantee growth and attractiveness. The policy translation of this issue corresponds to the Lisbon strategy defined by the Commission, which has based the new orientation of the regional policy in France (DIACT, 2002), and which has been translated in 'French PoC's in terms of policy.

Therefore, the focus is to support R&D, and competitiveness based on the reinforcing of the main assets of the country. Now, the policies aim at fostering the interactions at the local level, in order to move from agglomeration of activities to territories nurtured by linkages of interrelated knowledge elements, by efficient internal local labour market allowed by local cultural

identity and by high degree of cooperation among competitors, among firms and research institutes. Schematically, the policy has to create linkages to adjust organisational or cognitive distances on physical distance.

### 1.1.2. The French Poles of Competitiveness (French PoC): definition

The French PoC policy is of a particular interest in so far as it is the policy that structures most of the innovation policies implemented in France.

The French Pole of Competitiveness (*Pôles de compétitivité*) are defined by the “Interministerial Delegation for Territorial Competitiveness and Attractiveness” (DIACT) as:

« The combination on a given geographic space, of firms, training institutions and public or private research centres engaged to generate synergies in the execution of shared innovative projects. The partnerships can be organised towards a market or a scientific and technological domain »

‘Interministerial Delegation for Territorial Competitiveness and Attractiveness’ (DIACT), 2005

The French PoC policy, launched in 2005, is a comprehensive strategy addressing the industrial competitiveness and the R&D-led innovation. Major part of this strategy consists in encouraging the creation of industrial “clusters” able to possess a critical mass at the global level.

The PoC are designed to spark growth of innovative industrial activities and to strengthen the economic activities of some regions. This scheme is not only designed to develop emerging technologies (nanotechnologies, biotechnologies, microelectronics, etc.) but also to boost mature industries (automotive and aviation industry, etc...). France’s national policy reflects broader European support for competitiveness.

The policy’s goals can be sum up in three major axes:

(i) **Reinforce the specializations of the economy.** The poles of competitiveness are embedded in the French economic analysis tradition as they can be linked to the works of François Perroux. The analysis is based on the evidence that all international specializations are not equivalent, some sectors being more promising for the future of the economy than others. This conclusion has induced the definition of industrial policies (Longhi 2005);

(ii) **Strengthen the attractiveness of the territory’:** industrial policies are not new in France, (technopoles, and growth poles...) but the main change with French PoC comes from the fact that the territory dimension is taken into account. The French PoC are not only designed to spark growth of innovative industrial activities and to strengthen the economic activities of some regions, it is also

designed to develop emerging technologies (nanotechnologies, biotechnologies, microelectronics, etc.) but also to boost mature industries (automotive and aviation industry, etc...).

### **(iii) Favour the emergence of new activities via synergies between research and industry**

The aim of French PoC is to develop synergy in R&D projects, bringing together academics and people from industry and to support innovation through tax credits and subsidies. The aim of the policy is clearly to encourage, then support, projects initiated by the economic and academic agents in a given local area and to foster public-private local partnerships.

The French PoC policy is a merging between scientific & technological and industrial policies but with the territory dimension took into account. The French policies has therefore shifted from top-down to bottom-up policies: i.e. that projects are developed based on firms technological capabilities or knowledge bases, locally embedded. Only a part of the selection process is controlled by the government.

#### **I.1.3. How do they work?**

To implement this policy, the French Government drew up a large call for proposals for the creation of PoC at the end of the year 2002. The process is not simple, and needs a clarification.

#### **The French PoC's selection process:**

##### **1. A double selection process**

The French PoC selection process is twofold: the creation of the PoC in itself and once the PoC is created, the R&D projects selection process is the second stage.

#### **The French PoC creation process**

How the new policy aiming at the emergence of French PoC has been implemented? Following the meeting held on the 14<sup>th</sup> September 2004, the National Spatial Planning and Development Council (CIACT) decided to issue a call for projects which purpose is to select the first PoC. The call has not been drawn on a specific and limited focus, to leave a maximum of initiatives to the potential respondents and let the economic agents build dedicated projects depending on their own characteristics.

In order for a region to receive the French PoC label, a project is required to meet a list of specifications defined in November 2004 by the French government. There are four key criteria detailed in the call for projects:

- A development strategy that remains consistent with the economic development of the cluster's local area; the territory related to the cluster is endogenously defined by the project, and not given a priori according whatever administrative definition; a critical mass is implicitly necessary;
- A sufficient international visibility, in terms of industry and/or technology;
- A partnership between the different actors of the project and a structured, operational mode of governance;
- The capacity to generate synergies in R&D, resulting in the creation of new wealth with high added value.

The CIIACT has defined a threefold evaluation in this selection process:

- A regional evaluation conducted under the responsibility of the regional prefects, the local representatives of the government,
- An evaluation performed by an interministerial working group composed of the various ministries concerned by the project,
- An independent audit carried out by a group of qualified persons in the fields of business, research and higher education.

#### *The different levels of French PoC*

Another particularity of the French case is the different nature of the poles of competitiveness defined by the CIIACT. Basically, there are three main categories:

- **Global PoC:** six poles have been labelled 'global' in the first call
- **PoC with global vocation:** ten poles have this label, and should change status after 2008, towards global, or towards national depending on their performance.
- **National oriented PoC:** fifty poles have been labelled national in the first call, four have been added in July 2007.

The three categories underlie important differences. The different categories of PoC are assumed to differ in their economic potential, their R&D capacities as well as the nature of actors in terms of innovative capacities, involvement or potentiality of involvement in global innovative networks. Thus, the nature of the cluster is defined by the nature of the interactions. The nature and intensity of the interactions are not only related to proximity, but to the organizational structure governing these interactions between (local and external) firms and institutions, R&D or local governments (Markusen, 1996). Some of the poles will have the configuration of 'technopolitan districts' (Longhi, 2005), with important research – industry links and different related technologies and R&D resources. Others' configuration will work more like modern 'industrial districts', i.e. more and more oriented towards design, development and innovation to face the competition, but also more specialized. This difference can also be comprehended



through the legal entity representing the clusters; they are dominated and organised by leading firms in the “global” clusters, they are more related to local or regional bodies in the “national” ones, which help to organise the governance.

### **R&D projects selection process**

A PoC is not an end in itself. On the contrary, a PoC has been defined as a “forum for the creation of collective projects” between companies, research centres and academic institutions. The ultimate end is thus to create incentives to improve the interactions between the actors in the definition and emergence of R&D and innovation processes, to feed a process of collective learning (Keeble *et al.*, 1999) in order to build specific local capabilities.

R&D projects are thus the French PoC’s core activity and constitute the main factor of their competitiveness. They should involve all the potential actors of the cluster in a process of growing innovative capabilities and competitiveness of the firms, especially SMEs, that, in France, traditionally face a problem of lack of R&D resources. The project should also boost the research institutes through public-private partnerships. Indeed the projects have to include at least two firms and a research institute of the cluster in order to pretend to a label of French PoC. These projects are the engine of the working of the PoC and thus the pre-conditions of the success of this policy. The subsidies to the PoC are not pre-determined; they flow from the R&D projects that have gained subsidies. The CIIACT has also defined non-R&D projects (training, property investments, ICT infrastructures, monitoring economic developments, promoting local areas, international expansion, etc.), in so far as their definition and implementation through the PoC could be pivotal to the competitiveness of the firms and the local area’s economic development.

#### *The different steps of selection of collaborative innovation projects*

The nature of the selection process is very important. When a cluster is selected to be a PoC, it is endowed with a huge potential of attraction of new resources and of reorientation of the activities to the detriment of the other existing one. In fact, the subsidies and tax advantages are geographically specified. Different potential areas could have existed in France in a given technology, but once a French PoC is selected and advertised, an area can attract the whole activity, and “freeze” the map.

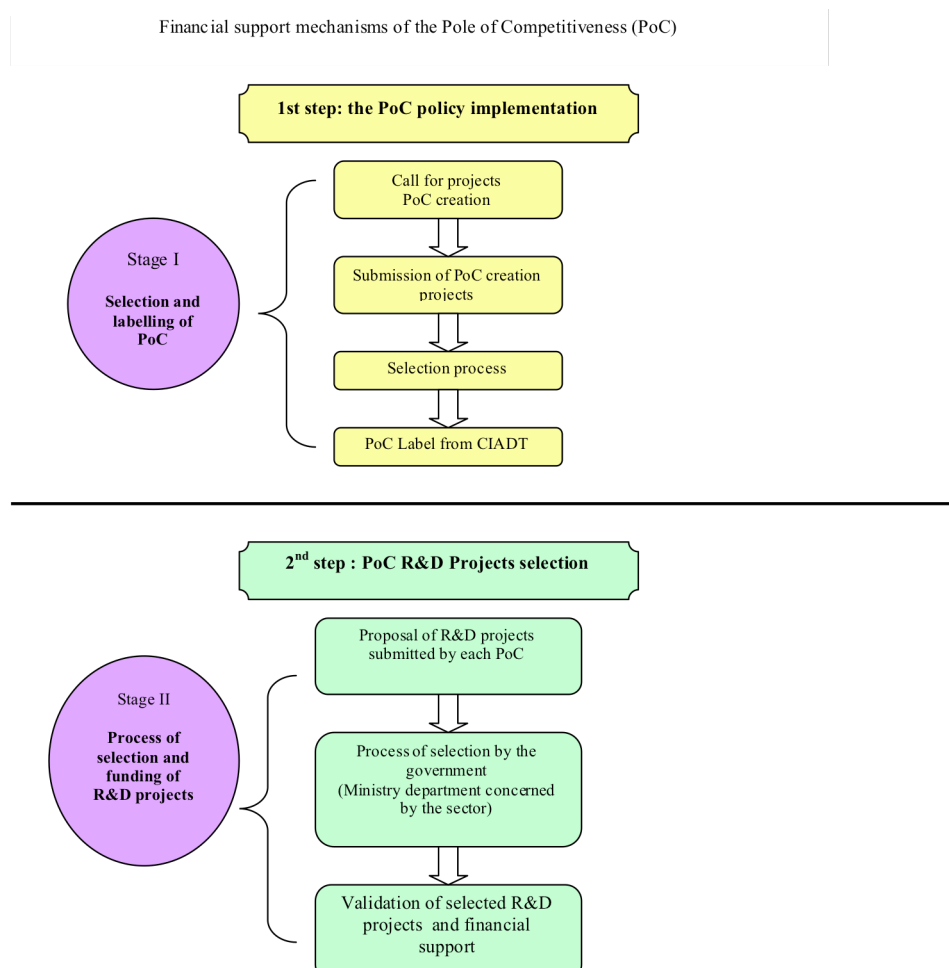
Therefore it can be possible to observe an *a priori* important flexibility in the choice of the location of the French PoC, but once a process of specialization and concentration has started, the firms are not neutral anymore regarding territories, they need to locate in the important markets or R&D areas to benefit from economies of scale. This process is reinforced in the case of the French PoC by the subsidies attached to the location. When implemented, it is very uncertain that a new economic policy is able to invert the process.

However, the efficiency of French PoC in the definition of the R&D projects will certainly

determine the clusters that will be ultimately selected. This is clearly a ‘hidden’ incentive of the strategy that the French PoC will have to internalise soon. Again, the label is not an end; it is the beginning of the process. The very low number of R&D projects submitted for financing support by most of French PoC shows that they have not necessarily understood the basic process at stake in the new industrial policy. Or, that the pre-existing configuration of the interactions in the French PoC, shaped by years of centralization, implies some time to invent and implement new efficient local governance.

The figure below (Figure 1) explains the double selection process: The first stage concerns the selection and the labelling process in order to create the PoC. The second process addresses the R&D projects.

Figure 1



## II. TERRITORIAL INNOVATION DYNAMICS AND SMEs

### II.1. Theoretical background

### II.1.1. *From industrial clusters to Knowledge based view of clusters: a literature review*

It is nowadays commonly acknowledged that innovation is at the source of competitive advantage for companies. In fact, in the context of the knowledge-based economy, where the competition is highly intensive, where technological change occurs in an extremely fast pace increasing the need for both specialization and rapid integration in international markets, the core of company performance lies in being innovative. To achieve this, companies need to have an efficient management of their internal resources as well as their external relationships, and need to manage increasing specialisation while at the same time exploring new opportunities. Therefore, cooperation in a cluster, where companies will be able to combine their resources and their knowledge assets is viewed as an efficient mean for successful innovation process. In this perspective, a great deal of studies has underlined the centrality of geographical proximity and the benefits of clustering. The advantages of clustering have been abundantly argued theoretically as well as empirically.

It is argued that territories are not interchangeable and therefore the choice of location will be driven by specific advantages in terms of competencies embedded in territories, regions, cities or any local systems.

Giving the large number of cluster studies, the multiplicity of cluster approaches and the absence of a clear definition, it seems useful to start by clarifying which cluster approach this paper is dealing with. According to Porter (2000), clusters are *"Geographic concentrations of interconnected companies, specialised suppliers, service providers, firms in related industries, and associated institutions in particular fields that compete but also co-operate"*.

However, if Porter (1990, 1998, 2000) gives a cluster definition that is widely used, his approach mainly concerns variables that can explain competitive advantages between nations and regions. He does not tackle the question of knowledge creation. His analytical framework shed light on the differences between traditional strategic factors of production (i.e. the surface of a region, its natural and human resources...) and new ones such as the level of specialisation of local workers, technological knowledge base, the institutional support and the local culture. This approach is a great contribution to strategic analysis in so far as it highlights a new aspect of competitive advantage that is not based on static factors (such as the availability of resources of a region, or the general microenvironment), but on dynamic aspects of competitive advantage based on qualitative factors of the local environment that are intensified with spatial concentration. Nevertheless, it doesn't look at the question of knowledge creation and diffusion. Nonetheless, the works of Michael Porter has nurtured a major strand of research that have deduced that clusters can be a relevant conceptual tool to explain the competitive advantage of regions and nations in a global economy. Consequently, when using the cluster concept in a Porterian way, the focus of analysis lies in the competitive advantages that contribute to regional development.

Recently researchers have interestingly tried to classify the different cluster approaches (Moulaert and Sekia, 2003; Calmé and Chabaud, 2007; Mendez and Bardet, 2008). But concerning our focus of analysis, the one by Preissl (2003) and Maskell, Kebir (2004) seems relevant. They have suggested three different focus when studying clusters. Firstly a cluster approach that analyses how to contribute to regional development (the one we have just discussed). Secondly, a cluster approach that shed the light on the factors that enhance the competitiveness of companies, and finally, a cluster approach that analyse how to support innovation. In the latter, researchers investigate clusters as relevant in terms of knowledge creation. Thanks to face-to-face interactions and the creation of common languages and institutions, companies in the cluster exchange and create new knowledge. This process is particularly essential when uncertainty is high, and when trial and error is necessary in the process of new product development (Solvell and Zander 1998, Spender 1996, Boari 2001). It is precisely in this last perspective that researchers emphasize on the impact of industrial clusters on innovation. Within the processes of innovation, the most complex process is the creation and sharing of knowledge (Conner, Prahalad et Grant, Spender 1996, Pavitt 2004). Following the knowledge-based-view theory, knowledge is socially constructed from information, and constantly renewed thanks to social interactions. This means that knowledge creation is a dynamic process that directly dependant on its social context (Nahapiet, Ghoshal, 1998 ; Granovetter, 1973; Coleman, 1988, Moran et Ghoshal, 1996 ). Therefore knowledge creation process is all the more complex as it implies for companies to reach high levels of relational, technological, organisational and managerial competence.

In this context, clusters are considered to be relevant in terms of knowledge creation. Clusters benefits on innovation are of three kinds (Preissl, Solimene 2003).

First, clusters offer benefits related to **agglomeration**. Marshall was the first, in the late 1880s, to develop theoretically and empirically the benefits of agglomeration. His line of thinking was followed and renewed by the researchers of the new industrial district since the late 1980s. Thus, the advantages of agglomeration are threefold (Van Geenhuizen, Reyes-Gonzalez, 2007; Boari 2001): (i) Advantages in terms of *transaction cost*. In a cluster context, transaction costs are supposed to be lower in so far as information about the members of the cluster, their reliability and their specific competencies spreads very quickly. (ii) Advantages in terms of *joint infrastructure*, in so far as members of the cluster share and combine resources they use. The dynamics of the cluster create a dependency between the number of firms clustered and the infrastructure provision. (iii) And last but not least, one of the most studied agglomeration benefits concerns: *knowledge spillovers*. Lot of works are giving attention to the flows of tacit knowledge as a result of spatial proximity and networking. In this line of thinking the postulation is that companies gain profit from a clustered location through meeting colleagues repeatedly and in person allowing for the exchange of tacit knowledge. In fact

while codified knowledge can be quite easily diffused thanks to any communication means, informal and tacit knowledge is spread rather accidentally. In fact, neither the transmitter nor the receiver knows in advance about its relevance before it is communicated (Saxenian 1994, Feldman 1994, Macdonald 1996). Thus, the exchange of informal knowledge accelerates technological advancement (Audretsch, Feldman 1996; Garnsey, Longhi 1998).

Secondly, clusters offer benefits related to the **scale of activities**. What is called *external economies* in a cluster perspective refers to the availability of infrastructure and resources. The larger the network, the more valuable it becomes for an individual company to take part to the cluster, because more potential partners and resources can be accessed. This is particularly true when it comes to the pool of qualified employees. The more companies search for specific competences the more the education system will build up adapted formations in order to provide the qualifications required. This phenomenon increases the general level of qualification in the cluster, its specialisation and its specificity which a company can draw advantage without paying for it. In the same functioning, the presence of a significant number of suppliers of a specific good, service, knowledge or technology favours the specialisation of the cluster. This attracts other firms in the cluster, generating higher quality of output and productivity. This is what is called “*economies of specialisation*”. Finally, one of the cluster benefits related to the scale of activities remains in *economies of scale*. The large number of customers in a cluster enables firms to produce in a larger scale and in the same time to benefit from shared facilities.

Lastly, clusters offer benefits related to **interactions**. In the context of a knowledge-based economy, most contemporary cluster approaches uppermost focalise their studies on the effects of immaterial assets, and particularly knowledge creation.

Despite of the development of ICT, innovative activities have the tendency to cluster. According to a stream of research, this is due to the fact that tacit knowledge is at the origin of value creation, particularly in very innovative sectors. However, tacit knowledge are « sticky context-laden » (Asheim, Gertler 2005) i.e. that they only take sense in meaningful context. This is the reason why they are bound to organisational and geographic locations. Thus, spatial proximity enables interactions that favour the exchange of tacit knowledge thanks to physical encounters, informal and face-to-face exchanges that enhance trust between partners and a fast diffusion of new ideas.

This shows the growing importance of social interaction in the process of innovation. Besides, Porter (1998) has identified that interactions between competitors and collaborators in a cluster is a crucial element of cluster innovation dynamics. As far as the cluster combines competitors' competencies as well as partners' competencies of a same industry, innovation is stimulated by competitive action on a one hand, and by exchanges as well as confidence between co-operating firms on the other hand. In fact, rivalry between firms creates a lot of pressure because of mutual observation, search for good reputation, and comparisons, it pushes technological devices towards

innovation. On the other hand, co-operation in technological development encourages the achievement of next generation technology. In this perspective, clusters can be viewed as ideal incubators for innovation (Preissl, Solimene 2003).

What emerges is that interactions are the constitutive element of clusters. As suggested by Wilkinson *et al.* (1998), successful clusters are those, which successfully combine dense internal inter-firm interactions and synergies with external, and often global, networks.

Even if it is becoming common knowledge that geographical configuration of economic actors is fundamentally important in shaping the innovative capabilities of companies; there are still a lot of unresolved questions about the nature of knowledge and its link with spatial concentration. When some maintain the knowledge creation process continue to be localized thanks to the role of local institutions as well as geographical proximity (Asheim 1999, Markusen 1996), others argue that tacit knowledge has become increasingly codified and hence omnipresent, ultimately eroding the competitive advantage of high cost regions and nations (Maskell, 1998,1999).

The recent literature on clusters demonstrates through empirical studies that the main interest of clusters is found in the fact that they are inserted into global industrial and commercial networks. In fact this critical literature show that geographical proximity is necessary for coordination within a cluster but not sufficient. It contributes to clusters performance, but only if, on a one hand, there are other shared dimensions (cognitive, technological dimensions...), and on the other hand if clusters are based on the complementarities between global and local relations. In these systemic localised configurations, actors interact with members of the cluster that are closed to them, and in the same time, this local network constitute open systems that enable them to have access to external knowledge.

The French government has precisely taken these insights into account. The answer of the French government has been to link regional development policies, R&D programs and technology policies to the regional development one, in line with the cluster approach in order to implement innovation related objectives. They have considered the geographical proximity of interrelated resources regarding R&D and industry as a necessary condition to face the challenges of globalisation. However, the gathering of different resources in the same location is not sufficient to foster innovation. The key factors of success (Castells and Hall, 1994), which have been repetitively proved to be ineffective in the academic literature (Garnsey and Longhi, 2004) are still used by some policymakers: geographical proximity does not imply interactions. Therefore, the French PoC policy's priority is to support interactions that stimulate innovation. Nevertheless, interactions can only emerge when there are other shared dimensions (cognitive, technological dimensions...), and if clusters are based on the complementarities between global and local relations. In these systemic localized configurations, actors interact with members of the cluster that are closed to them, and in the same time, this local network constitute open systems that enable them to have access to external

knowledge.

Interestingly, the French Pole of competitiveness, are projects defined and run locally by firms on the base of proven existing resources and competences territorially embedded but the incentives and selection processes are public policy initiatives.

The pre-existing configuration as well as the nature of knowledge is then of main importance.

This conceptualisation of innovation has given rise to a whole strand of research that start from the analysis of the territory to highlight the capacity of regional private and public actors to interact and draw advantages of their interactions to improve the competitiveness of regions. This is the reason why the policies fostering innovation within regions are flourishing all over Europe and the United-States (Asheim et al., 2003; Cooke, Boekholt et Tödtling, 2000 ; Cooke, 2004 ; Doloreux, 2004).

### II.1.2. The question of SMEs

But as it has been argued by Longhi (2008) and Mustar (2008), while fifty years ago, the French industrial policy was focused on large et very large companies (“the grand champions”), nowadays industrial policies are supporting SMEs in priority.

This shift account for researches and facts that extensively explain that SMEs are especially very innovative in knowledge intensive activities and they constitute the major drivers for the development of regions (Filion et al, 2007).

As Keeble, Oakley (1995), Longhi (1998) and Tamasy, Sternberg (1995) have suggested, SMEs and particularly high-tech SMEs have a more favourable long term influence on the economy of nations and regions than “traditional” SMEs. They claim that the reasons of this influence can be summarised in five points:

1. SMEs are more often at the initiator of radical innovations.
2. They evolve more rapidly on the grounds of employment and sales
3. They recruit more highly qualified employees with high wages, thus boosting the regions’ economy as well as entrepreneurship.
4. Their offer and services are usually national or global generating more consistent revenues for nations and regions.
5. They are more likely to get involved into cooperation projects multiplying their influence on regions’ growth and wealth.

Furthermore, the different works on industrial and regional economy focalising on the notion of proximity, have shown that most configuration of geographically localised organisations are essentially composed of SMEs (Gilly, Torre 2000).

Cooperation in a cluster configuration has in fact been demonstrated as a potential factor of innovation. In this context, cooperation is considered as a mean to complete SME's internal learning process and facilitate their innovation process (Huet, 2006). SMEs do need cooperation in order to innovate. The resources they gain from cooperation complete their internal resources. The integration of SMEs into the French PoC is then a privileged way for SMEs for their innovation activities compensating for their internal deficit.

Moreover, the results of the comparison of successful clusters, networks in regions reveals a relatively high proportion of SMEs reporting close links with other firms within the region, especially between customers and suppliers. As suggested by Keeble, Wilkinson (2000) in spite of the great differences of the clusters analysed, such vertical inter-SME links are also often important for the innovative activities of local firms. The importance of vertical links does not stem only from geographical proximity, but also reflects other forms of closeness (technological, organisational, institutional, social and cultural) which facilitate innovation and decrease the risks and uncertainty surrounding the innovation process.

Therefore, theoretically and empirically, lot of research suggests that SMEs need to cooperate in order to innovate (lack of resources, need to complete and combine their knowledge to find new market opportunities...) and at the same time they are a vital element in the existence, functioning, and survival of innovative milieux.

**The French PoC policy has taken these facts and results of analysis into account and has integrated them in the policy.** The integration of SMEs has become a real condition for the success of the new French PoC policy, and a criterion for selection. SMEs involvement in collaborative projects is promoted.

However, the results of the call for projects show that French PoC are far to be successful in all regions: some do have projects, others don't, involving more or less SMEs, but generally quite insufficiently. Consequently, the problems SMEs are facing is still remaining despite of the financial investments. Although some regions have succeeded in involving SMEs in their innovation dynamics, others are still not able to. Therefore the question whether the reasons really come from the policy or from SMEs aptitudes to innovate should be asked.

But, when studying the state-of-the-art literature as well as ministerial reports, one can find out that this issue of integrating SMEs into innovation projects of clusters is only questioned two different



ways: First by questioning the specificities of SMEs management (i.e. lack of resources, problem of timing, financial needs...); Secondly by denouncing the complexity of existing support programmes aiming at helping SMEs to innovate (too technocratic, administrative heaviness etc.). Nevertheless, the only study of intrinsic weaknesses of SMEs management is not sufficient to explain this lack of integration. Besides, innovation dynamics are significantly different from a cluster to another and many failures of innovation policies can be explained by the lack of identification of the territorial specificity in terms of knowledge creation process. As explained in the former section, the localised knowledge creation dynamics should be analysed as well as the nature of interactions within clusters in order to understand their influence on SMEs integration into collaborative innovation projects.

### **III. CURRENT INSIGHTS INTO A SPECIFIC FRENCH POLE OF COMPETITIVENESS**

#### **III.1. Methodology**

The focus of research reported here is on the role of French PoC territorial specificities in the innovation and growth of innovative high-tech SMEs through their involvement into collaborative R&D projects as far as PoC are structured by projects.

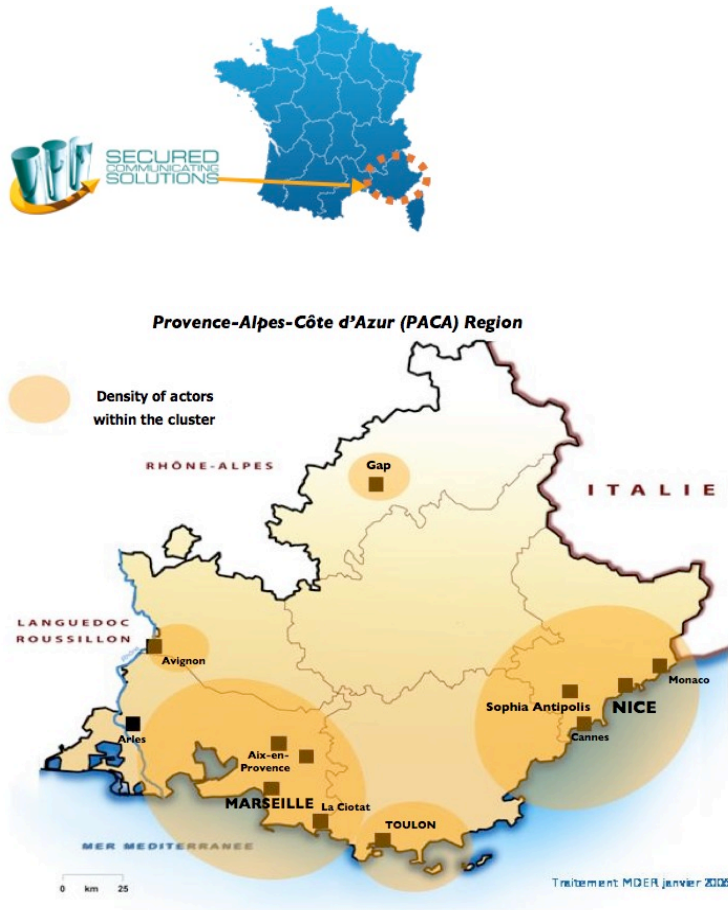
This issue has been analysed by focusing on one specific French PoC: the Secured Communicating Solutions PoC (SCS PoC).

##### **III.1.1. The SCS Pole of Competitiveness**

###### **▪ *What is the SCS Pole of Competitiveness?***

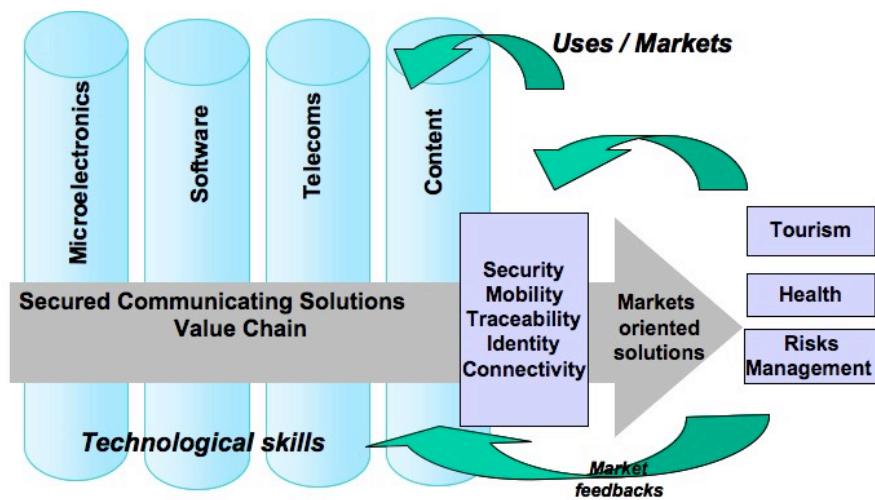
The SCS PoC is one of the French PoC located in the French Riviera in the Provence-Alpes-Côte d'Azur (PACA) region, at the junction between Marseille, the third largest city in France, and the French Riviera, including Nice and Sophia-Antipolis Science Park. The cluster intends to become the worldwide reference for hardware-software integration to transmit, process and exchange information in a reliable and secured way.

Figure 2 & 3: Localisation of the Secured Communicating Solutions PoC



The SCS cluster fosters convergence between four different sectors: microelectronics, telecommunications, software and multimedia.

Figure 4 : The SCS PoC Value Chain



Their slogan is “du silicium aux usages” which means “from silicon to uses”. In fact, the SCS cluster concept has been **founded on the idea to go beyond the 4 different activities of the sector (Telecommunications, software, microelectronics, multimedia) in order to federate the complementarities of actors throughout the added value chain**. Consequently the strength of this cluster concept comes from the idea of combining competences throughout the added value from microelectronics to multimedia or telecom, from silicon to uses, from the conception of the product to the market. On the other hand, the goal is to support collaborations between firms (SMEs and large firms) and public research centres throughout a large territory from Marseille to Nice.

Figure 5 : The SCS PoC concept



The SCS cluster involves 330 firms (Small & Medium Enterprises and large Groups), research institutions and higher education centres. The objective is to develop a critical mass as well as network impact among the participants. So far, 25 major international industrial groups employing 6 500 people in R&D, including Alcatel Space, Amadeus, Atmel, France Telecom, Gemplus, HP, IBM, Philips, SAP, STMicroelectronics and Texas Instruments are involved. Some prominent research and training institutions are members of the cluster: Aix-Marseille University, Nice-Sophia Antipolis University, French National Center for Scientific Research (CNRS, in Marseille and Sophia Antipolis), EURECOM Institute (Sophia Antipolis) and French National Institute for Computer Science and Control (INRIA, in Sophia Antipolis).

In PACA region, already 41 000 people are working in the Information and Communication Technology fields. Fourteen Universities and schools are training over 1,500 engineers and doctorate researchers per year and there are over 1,200 researchers in public research. The SCS market, currently estimated at more than € 200 billion is expected to reach more than € 300 billion in the year 2009 (DATAR 2007).

The SCS PoC has around 145 projects selected (DIACT 2007).

Some examples of this cluster's main projects are the following:

- *M-Tourism*: Promoting technological innovation in the hospitality sector and developing mobile technologies designed for travellers. Applications are in: e-commerce, virtual tours, geolocalisation, traceability, security, etc.

- *Multimodal platform*: Deployment of a prototype multi-standard, cellular & fixed and wireless network, in a real-world environment, in order to define the hardware and software architectures required for the terminals and base stations of the future.

- *PAC-ID*: the project is dedicated to the healthcare sector and is made of two packages:

- “*BioBanque*”: an RFID solution that fulfils the needs of personalised healthcare thanks to the identification and tracking of biological samples and data integration. An example of its application: cancer research using “tumorothèques” – tumour databases.

- “*Parcours Patient*”: wireless communication technologies used throughout the entire patient care process in hospitals.

- *Trust Me SSIMM*: is for new services based on mobile technologies. SSIMM stands for “Secured Solutions for Mobile Multimedia Internet” and relates to video and audio downloads, secure messaging connections, mobile-travel applications, mobile-payment, mobile-TV, personal data storage, etc. SSIMM paves the way to future fixed/mobile convergence. The Secured Communicating Solutions cluster should thus enable the shareholders to consolidate their position in the related markets, in developing new products, improving R&D productivity and reducing time-to-market research products. SCS cluster also intends to spearhead the development of new markets in the tourism, healthcare, environment management, digital identification, traceability, and logistics sectors

The SCS cluster has managed to get the leading position in several markets: microelectronics, IT, smart cards, mobile, satellite telecommunications and business services. For instance 40% of the National semiconductor production originates from PACA region.

Finally, the cluster pursues 5 main objectives: (i) Encourage the emergence of innovative and collaborative projects on the priority topics of Identity, Connectivity, Mobility and Traceability (ii) Help the participants and their projects up to the certification stage (iii) Support the integration of small-and-medium enterprises (SME) with the cluster's projects (iv) Sustainably secure the R&D activities through the creation of shared technological platforms and innovation center (v) and henceforth contribute to the construction of a structured ecosystem encouraging the development of new ICTs.

Taking into account all of these insights, the empirical study of the SCS PoC seems to be a very good way of analysing the integration of SMEs into the territorial innovation dynamics of clusters.

In fact, the substantial number of SMEs members of the cluster, the specific issues linked to the collaboration throughout the value chain and the sectoral variety as well as the complexity of the history of the territory provides the SCS PoC with great interest for the analysis.

### III.1.2. Questionnaire and semi-direct interviews

The identification of French PoC specific territorial dynamics has planned to be analysed through the combination of both quantitative and qualitative methods.

The present paper only tackles the first phase of the research, i.e. the exploratory quantitative study of the SCS cluster and its preliminary results.

First, the quantitative method (exploratory) is used for the exploratory study of the cluster dynamics through the set up of a questionnaire.

Secondly, the qualitative method (main method of the research project, but the work is still in progress) is being used through semi-directive interviews of SMEs, and focus on main territorial innovation dynamics identified thanks to the preliminary results of the questionnaire and the literature review. Four types of actors are interviewed: SMEs members of the SCS PoC and involved in a project that has been selected and funded, SMEs members of the cluster but not involved in a project that has been selected and funded, SMEs that are not members of the cluster, and keys institutional actors of the territory (members of the governance structure, standardization organisation, politics).

Thus, as we deal with the first phase of the research, the quantitative method has been used though the launch of a questionnaire. The questionnaire has been drawn up to focus on the identification of the main characteristics of the territory and the nature of the relations between the SMEs of the PACA Region and their territory. The purpose is to identify the different territorial innovation dynamics that emerge.

The questionnaire was set up with the main objective to capture the specificity in nature of the SMEs of the SCS PoC in terms of innovation strategies linked with the territory (is there a homogeneity of SMEs?). In order to tackle this issue the questionnaire was structured around three main topics: the specificities of SMEs, the nature of the SME-territory relations and how SMEs get involved into the collaborative projects of the competitive cluster. These topics were addressed through the questions on the nature of the cooperation between SMEs and the other members of the cluster both before and after the implementation of the French PoC policy, the type of relationships and collaboration they are

involved in, the nature of the networks they are inserted in, their motivation to become members of the PoC and in what extent they are involved or not in collaborative projects of the cluster or outside the cluster (European projects etc.).

A database was built, taking inventory of the SMEs of the PACA Region that work in one of the 4 sectoral activities of the cluster. Among them, 98 SMEs members of the cluster in 2007 have been identified.

The questionnaire was sent to all SMEs members of the cluster in a first round 2007 and a second round was launched in 2008 (December) but were not analysed yet. Around 50% of the SMEs have replied in 2007 (48 SMEs)

## **III.2. Preliminary results**

### **III.2.1. The SCS Pole of Competitiveness' projects**

The PoC are structured by the innovation projects they support, and the research precisely started from the evidence that despite the government investments on SMEs through the PoC programme, they are not very well integrated in the R&D projects the programme promote. Consequently, the main questions asked were addressing SMEs integration into collaborative innovation projects.

They concern the 3 different stages of selection of the PoC R&D projects: the proposal of projects, the projects selection (labelling), and the funding. The questions were also asked regarding collaborative innovation projects outside the PoC programme, in order to measure the efficiency of the new policy, as well as the capacity of SMEs to get involved in R&D projects inside and outside the PoC if there is a difference whatsoever.

The preliminary results are quite interesting in so far as they evidence 2 clear groups of SMEs according to their geographical location on a one hand, and according to their capacity to get involved into innovation projects inside or outside the PoC programme.

The SMEs that are located in the West side of the SCS PoC geographical area (i.e. Rousset, Marseille) are called "*Rousset SMEs*" and the SMEs located in the East side of the SCS PoC geographical area (i.e. Nice, Sophia-Antipolis) are called "*Sophia-Antipolis SMEs*"

The results are illustrated through the three main steps of the project selection and funding.

Thus, *Rousset SMEs* are involved in a far greater number of innovative projects submitted for funding than *Sophia-Antipolis SMEs* (Figure 6). Once the submission and selection process has been done,

some projects are “labelled” but not chosen for financial support yet. Thus, Rousset SMEs still have more projects selected (or labelled) than Sophia-Antipolis SMEs (Figure 7).

Figure 6

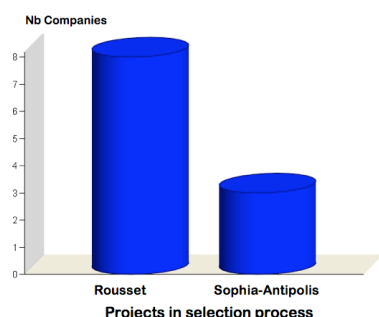
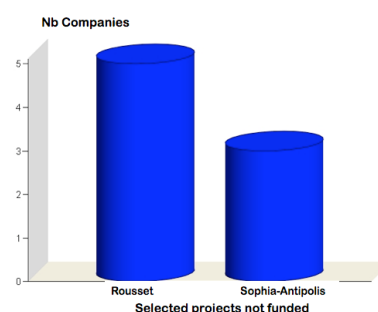
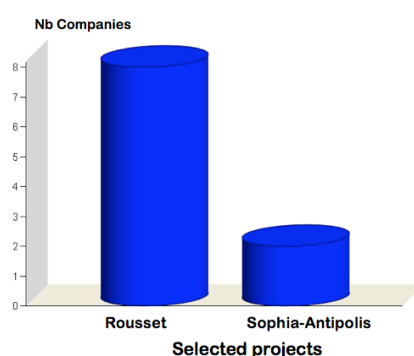


Figure 7



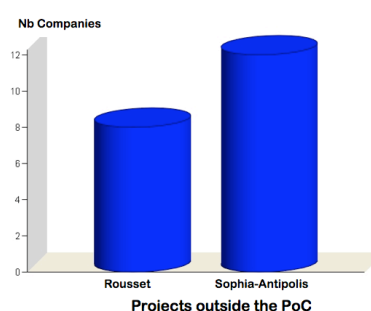
Among the projects selected, the Ministry concerned by the project field finally validates only some of them for financial support. The questionnaire reveals that, again, Rousset SMEs are far more successful in getting involved in selected and funded R&D projects of the PoC than the Sophia-Antipolis SMEs.

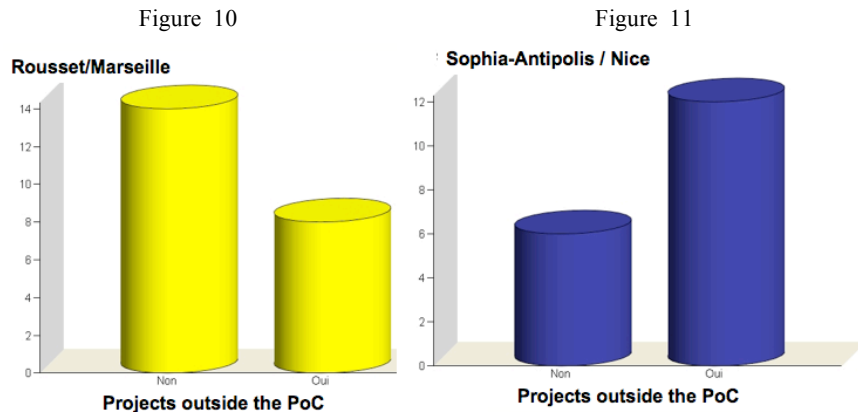
Figure 8



But, surprisingly, when it comes to innovation projects that are outside of the PoC programme, then, the configuration is completely reversed. Sophia-Antipolis SMEs are involved in a substantial number of projects “outside” of the PoC programme (mostly european projects) while Rousset SMEs are less.

Figure 9





This preliminary analysis of the questionnaire concerning the integration of SMEs into innovation projects put forth the argument that there is two different populations of SMEs in the same PoC, and that they are succeeding more or less in integrating innovation projects. These 2 populations of SMEs reveal to be clearly located in two geographical areas. However, the only question of geographical location cannot be enough to explain the capacity of SMEs to get involved in innovation projects. It might be expected that the ability of SMEs to get involved in innovation projects is strongly related to the industrial sector.

### III.2.2. Industrial sector and geographical location

The question whether the sector has an influence on the capacity to collaborate is then put into question. As far as the SCS PoC's concept is precisely to go beyond the 4 different activities of the SCS sector in order to federate the complementarities of actors throughout the value chain, the question about the geographical location of SMEs and their sector of activity has been asked. The results reveals that quite powerful evidence regarding how they spread over the PoC geographical area: clearly the Rousset SMEs sectoral activity is linked with microelectronics: 80% of the SMEs that have answered the questionnaire and which sectoral activity is microelectronics are located in Rousset-Marseille, the west side of the PoC geographical area, while only 20% are located in Sophia-Antipolis. On the other hand, the majority of SMEs working in the Telecom field and that have answered the questionnaire are located in Sophia-Antipolis Science Park or in Nice, that is to say the eastern side of the PoC geographical area.



Figure 12

Sectoral activity by geographical localisation	Sophia-Antipolis	Rousset
1. Microélectronique	20 %	80 %
2. Software / Multimedia	45%	55 %
3. Telecom	67%	33%
4. Consulting	58%	42%

If the SCS PoC concept was built on the idea to combine the competences throughout the value chain from microelectronics to telecom, from “silicon to uses”, the survey shed the light on the fact that, this value chain is actually drawn quite clearly across the territory of the PoC forming two different clusters of SMEs in a same PoC:

The firms in Rousset-Marseille are mostly working in the field of microelectronics, with competences in production and manufacturing, while the firms in Sophia-Antipolis and Nice have competences oriented towards services, uses, and the application of technologies.

Nevertheless, this new insight into the two different population of SMEs is not enough to understand why the *Rousset SMEs* have a better ability to integrate projects of the PoC than the *Sophia-Antipolis SMEs*.

### III.2.3. Nature of cooperation

Therefore, it seems necessary to understand the sector specific nature of the relations between SMEs and different local actors.

Indeed, the nature of cooperation may give some insights into how SMEs get inserted into the different networks of a territory, the power relations, the hierarchy (linked to subcontracting relations for instance) and if these features helps them to participate in innovation projects of the PoC or on the contrary prevent them from getting involved.

The preliminary results show that most Rousset SMEs have already had subcontracting cooperation with the large firms of their territory or have been suppliers of large firms. They also have more R&D partnership with the organisations of their territory, i.e. other SMEs, large firms and Universities. The Sophia-Antipolis SMEs nature of cooperation is still very dispersed. The second round of the launch of the questionnaire should give more detailed data on this question of cooperation. Particularly for the East side of the SCS PoC.

As the localisation of the social capital of SMEs's leaders may be an insight into how far they are inserted in the territory, questions have been asked on the localisation of the clubs and societies of the SCS PoC they are involved in.

The results show that the Rousset SMEs are more involved in clubs and societies of the SCS PoC than Sophia-Antipolis SMEs. Thus, 76% of Rousset SMEs are nvolved in clubs and societies of the SCS PoC against 50% for the Sophia-Antipolis SMEs.

Figure 13

Involvement in clubs and societies of SCS cluster by gographical localisation	Sophia-Antipolis	Rousset
No	50.00%	24.00%
Yes	50.00%	76.00%

But when it comes to the club and societies outside the SCS PoC, then, Sophia-Antipolis SMEs are for 64% of them involved in a club.

Figure 14

Involvement in clubs and societies OUTSIDE the SCS Cluster by géographical localisation	Sophia-Antipolis	Rousset
Non	36%	48%
Oui	64%	52%

## IV. DISCUSSION, RESEARCH AGENDA, AND CONCLUSION

### IV.1. Discussion

#### IV.1.1. Two different dynamics of innovation

In the question: what are the mechanisms that facilitate or constitute difficulties for SMEs to integrate collaborative projects?

The preliminary results of this exploratory research evidence the existence of highly different territorial dynamics and two distinct level of integration of SMEs into the PoC collaborative projects.

Two main distinctive territorial dynamics can be identified, depending on the nature of the interactions implemented locally. The first one, seemingly quite efficient in terms of integration of SMEs, characterise the Marseille side of the SCS pole of competitiveness, the second one refers to Sophia Antipolis. Forming two distinct clusters in a same PoC. The Marseille pole is composed of large firms, of SME and institutes of research. Their knowledge bases seem to be characterized by the existence of a “codified dominant design” (Henderson, Clark 1990) controlled by the large firms included in the

poles (ST Microelectronics and Atmel); these firms are organising the combination of the SMEs' various specific knowledge. Therefore, it seems relevant to focus on the nature of knowledge flows.

## **IV.2. Research agenda**

### **IV.2.1. Knowledge flows analysis and proposition of a framework to analyse them.**

The recent studies on clusters highlight the crucial role of interactions between the actors of a same territory in the development of innovative capacities. They are the cradles of confidence and reciprocity; they favour the reduction of uncertainty, the coordination of actors and enhance learning capacities (Camagni, Capello 2000). Therefore, recent lines of thoughts focusing on clusters tend to stress more and more on social dynamics of interactions rather than on traditional key success factors (Bahlmann, Huysman, 2008).

Therefore, the question of the nature of the knowledge exchanged is a crucial insight into the territorial innovation specificities. Knowledge flows for the competitiveness of companies with a geographical analysis become a key question. The goal is then to look at the different interaction structures in order to determine how the knowledge is created, structured and diffused. In fact, if knowledge spillovers are one of the main advantage of spatial agglomeration, the analysis of how knowledge is managed, how many actors it diffuses to, with what degree of formality and with what speed, all play a key role in the configuration, dynamics and evolution of regional clusters (Boisot 1997, Boisot et al 2007, Canals et al 2008).

This preliminary research as well as the first insights of the interviews conducted with SMEs of the PoC draw us towards the analysis of the cognitive dimension of the interactions. In other words, to enhance the analysis of the interactions that support the territorial innovation dynamics, we suggest a focus on the relational and cognitive dimensions of these interactions by using the Boisot's Information-Space (I-Space) framework (1998). In the I-Space framework Boisot proposes a dynamic analysis of knowledge and information exchanged. The application of the framework aims both at characterising the nature of the knowledge exchanged (concrete – not codified / abstract – codified) and the governance features that influence the knowledge exchange in a given territory. Notwithstanding, analysing knowledge through the only lens of tacit-codified is insufficient. The reality is more complex as can attest the example of the management of scientific codified knowledge in which the processes of production and translation involve a great part of tacit knowledge Heyraud (2003). This is the reason why, in the project we suggest to enlarge the analysis of knowledge by distinguishing two types of knowledge: the technological knowledge and the architectural knowledge (Henderson, Clarke 1991).

### **IV.3. Conclusion**

#### **IV.3.1. Main conclusions**

The French PoC is the main innovation policy nowadays, it is the policy that structures most of the innovation policies implemented in France. Nevertheless, very few papers explain how they work and the difficulties they are confronted with, particularly concerning SMEs integration. This paper has introduced the French PoC policy, had positioned them, and has explained how the process of implementation of the PoC as well as the process of selection and funding of R&D projects work.

Besides, the preliminary research has enabled to prepare the ground to analyse further territorial innovation dynamics of clusters particularly with regards to knowledge.

A preliminary analysis of the data has revealed the following: there are two distinct models of insertion of SMEs into the SCS PoC, shedding the light on the existence of two different localised innovation dynamics that actually forms two distinct territorial clusters in a same PoC. This put into question whether the lack of territorial coherence has any influence on the PoC's governance?

More generally, the three main conclusions drawn from the first results are the following:

The question of SMEs' involvement into the French PoC does not only come from technological capabilities but from the nature of the interaction systems in which they evolve and how they get inserted in territorial networks.

In order to foster SMEs integration into collaborative projects of PoC, it is necessary to understand the sector specific nature of the relations between SMEs and different local actors rather than simply focusing on the weaknesses of SME management or on the complexities of existing support programmes, as it is usually claimed.

As knowledge exchange between firms and institutions are the main drivers of spatial agglomeration the nature of knowledge – i.e. codified-tacit /architectural-specific- (Henderson, Clarke 1991) as well as the way knowledge is managed, structured, diffused and with what degree of formality (Canals, Boisot, Mac Millan 2008) play a key role in our analysis of territorial cluster dynamics.

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**Rani J. DANG** – PhD Student - University of Nice Sophia-Antipolis, France. December 2008 (Draft)

